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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/801,267 | 03/16/2004 | Rocco DiFoggio | 584-37008-USCP | 4720 |
| 24923 | 7590 | 09/23/2005 | EXAMINER | |
| PAUL S MADAN MADAN, MOSSMAN & SRIRAM, PC 2603 AUGUSTA, SUITE 700 HOUSTON, TX 77057-1130 | | | KUNDU, SUJOY K | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2863 | |

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/801,267

Applicant(s)

DIFOGGIO ET AL.

Examiner

Sujoy K. Kundu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 31-40 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 31-40 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/22/2005</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

Claim 3 is objected to because of the following informalities: Applicant refers to a downhole tool of claim 2, applicant may want to change downhole tool to apparatus as suggested in claims 1 and 2. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1, 11, 31 is rejected under 35 U.S.C. 102(b) as being anticipated by Birchak et al. (5,741,962).

Birchak teaches the features of the claims for determining a property of a fluid downhole comprising:

a resonator associated with the fluid downhole (Fig. 2, 109);

a controller for actuating the resonator (Column 4, Lines 12-22);

a monitor for receiving a response from the resonator to the actuation of the resonator such that the response is associated with the fluid; and a processor for estimating the property for the fluid downhole (Column 4, Lines 12-22).

Claim Rejections - 35 USC § 103

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2-4, 12-14, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birchak et al. (5,741,962) in view of Kleinberg (6,346,813).

With regards to claim 2,12 Birchak does not teach wherein the processor uses a chemometric equation for estimating the property. However, Kleinberg teaches an apparatus wherein the processor uses a chemometric equation for estimating the property (Figure 5, Column 7, Lines 23-35). A view of Figure 5 of Kleinberg shows generally excellent correlation between T_2 and viscosity. Knowing the measured data, as shown in the example of Figure 5, one could determine the curve associated with the fit of the data. From subsequent measurements of T_2 one could then use the curve to determine an estimate of the viscosity. Therefore, the curve merely represents a "chemometric" equation for the parameter T_2 and can be used to determine viscosity is and NMR times T_1 and T_2 are correlated.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the processor uses a chemometric equation for estimating the property as taught by Kleinberg into Birchak for the purpose of determining a fluid property.

With regards to claim 3, 13, 33 Birchak does not teach the downhole tool, wherein the processor applies the resonator response to the chemometric equation to

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determine the property. However, Kleinberg teaches the downhole tool, wherein the processor applies the resonator response to the chemometric equation to determine the property (Figure 5, Column 11, Lines 1-21). A view of Figure 5 of Kleinberg shows generally excellent correlation between T_2 and viscosity. Knowing the measured data, as shown in the example of Figure 5, one could determine the curve associated with the fit of the data. From subsequent measurements of T_2 one could then use the curve to determine an estimate of the viscosity. Therefore, the curve merely represents a "chemometric" equation for the parameter T_2 and can be used to determine viscosity is and NMR times T_1 and T_2 are correlated.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the processor uses a chemometric equation for estimating the property as taught by Kleinberg into Birchak for the purpose of determining a fluid property.

With regards to claim 4, 14, 34 Birchak does not teach wherein the processor uses a function for deriving a chemometric equation from measured resonator response correlated with known fluid property values (Figure 5, Column 7, Lines 23-35). A view of Figure 5 of Kleinberg shows generally excellent correlation between T_2 and viscosity. Knowing the measured data, as shown in the example of Figure 5, one could determine the curve associated with the fit of the data. From subsequent measurements of T_2 one could then use the curve to determine an estimate of the viscosity. Therefore, the curve merely represents a "chemometric" equation for the parameter T_2 and can be used to determine viscosity is and NMR times T_1 and T_2 are correlated.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the processor uses a chemometric equation for estimating the property as taught by Kleinberg into Birchak for the purpose of determining a fluid property.

Claims 5-8, 15-18, 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birchak et al. (5,741,962) in view of Kleinberg (6,346,813) as applied to claim 1 above, and further in view of McFarland et al (6,182,499).

With regards to claims 5-8, 15-18, 35-38 Birchak and Kleinberg do not teach wherein the properties are viscosity, density, dielectric constant, and resistivity. However, McFarland teaches wherein the properties are viscosity, density and dielectric constant (Column 11, Lines 42-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the properties are viscosity, density, dielectric constant, and resistivity as taught by McFarland into Birchak and Kleinberg for the purpose of determining a system and method for determining formation of fluids.

Claims 9-10, 19-20, 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birchak et al. (5,741,962) in view of Kleinberg (6,346,813) and McFarland et al (6,182,499) as applied to claim 1 above, and further in view of He et al (5,798,982).

With regards to claim 9-10, 19-20, and 39-40, Birchak, Kleinberg, and McFarland do not teach the apparatus wherein the processor applies the chemometric estimated

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property to a Levenberg-Marquardt (LM) algorithm to determine a fluid parameter value for the fluid.

However, He teaches the apparatus wherein the processor applies the chemometric estimated property to a Levenberg-Marquardt (LM) algorithm to determine a fluid parameter value for the fluid (Column 2, Lines 48-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the apparatus wherein the processor applies the chemometric estimated property to a Levenberg-Marquardt (LM) algorithm to determine a fluid parameter value for the fluid as taught by He into Birchak, Kleinberg, and McFarland for the purpose of determining a system and method for determining formation of fluids.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sujoy K. Kundu whose telephone number is 571-272-8586. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKK
09/18/2005

BRYAN BUI
PRIMARY EXAMINER

